

Executive Summary

The purpose of this report is to document the data, methods and assumptions used by staff of the South Florida Water Management District (SFWMD) to develop minimum flow and level (MFL) technical criteria for Lake Istokpoga. The Florida Water Resources Act requires that water management districts develop a priority list and schedule for the establishment of MFLs for surface waters and aquifers within their jurisdiction (Section 373.042 (1), F.S. (Florida Statutes) (see **Appendix A**). This list is included in the *District Water Management Plan* for the SFWMD (SFWMD 2003a). The 2004 update to this list identified the need to develop MFL criteria for Lake Istokpoga by 2005.

At 27,692 acres, Lake Istokpoga is the fifth-largest lake in Florida. The lake is generally shallow, averaging only 4 to 6 feet in depth. The major tributaries into Lake Istokpoga are Arbuckle Creek from the north and Josephine Creek from the northwest. Water is discharged from the lake through two primary outlets: the Istokpoga Canal, which flows eastward to the Kissimmee River, and the S-68 Structure, which releases water through a series of canals southeastward to both Lake Okeechobee and the Kissimmee River. A reduction of high lake levels has provided the catalyst for development around the lakeshore, including agriculture (citrus and caladium farms), pasture land, and residential and commercial establishments. Many lakeside areas that once flooded seasonally or infrequently are now drained. The lake is treasured by local residents for its recreational and scenic qualities. It is also an important regional resource that is being studied as part of the Kissimmee River Restoration Project and the Comprehensive Everglades Restoration Project (CERP).

The Lake Istokpoga watershed is located in Highlands and Polk counties, and the lake is currently managed to prevent flooding of surrounding lands and to maintain water levels sufficient to provide recreational access, maintain fish and wildlife habitats and serve as a source of water supply for agricultural areas to the south in Glades County. Prior to development, most of the area around Lake Istokpoga was characterized by nearly level, poorly drained flatwoods, and the land south of Lake Istokpoga once contained an extensive marsh and swamp. Today, drainage ditches and water supply canals cut across historic flowways, accelerating runoff into the lake and diverting water from parts of the watershed, lake and surrounding lands toward the Kissimmee River and Lake Okeechobee. Water is withdrawn from canals and groundwater wells to support large citrus groves situated on the Lake Wales Ridge, cattle farms on the Indian Prairie and commercial farming of ornamental landscape plants and truck crops on former wetlands located south of Lake Istokpoga. These water supply, structural and land use changes were considered during MFL criteria development.

Section 373.042 (1), F.S., (**Appendix A**) defines the *minimum level* as follows:

the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area

For purposes of establishing minimum levels, SFWMD Rule 40E-8.021 (**Appendix A**) defines *significant harm* as follows:

the temporary loss of water resource functions that result from a change in surface or groundwater hydrology, that takes more than two years to recover, but which is considered less severe than serious harm

Water resource functions protected under Chapter 373, the Florida Water Resources Act, are broad and include flood control, water quality protection, water supply and storage, fish and wildlife protection, navigation and recreation. Water management districts may also consider any changes and/or structural alterations that have occurred within the watershed and may develop a recovery and prevention strategy for water bodies that do not, or are not expected to, meet the proposed criteria during the planning horizon.

Establishing minimum flows and levels alone will not be sufficient to maintain a sustainable resource over the broad range of water conditions occurring within the managed system. Setting a minimum flow is viewed as a starting point to define water needs for sustainability. The necessary hydrologic regime for restoration of defined priority water bodies also includes the use of water reservations and other water resource protection tools. Achieving the required water levels throughout these systems is an overall, long-term restoration goal. MFLs are intended as part of a comprehensive water resources management approach geared toward ensuring the sustainability of the water resources. The proposed MFL criteria are not a “stand-alone” resource protection tool but should be considered in conjunction with all other resource protection responsibilities granted to the water management districts by law. These include consumptive use permitting, water shortage management and water reservations.

For Lake Istokpoga, water level stabilization has caused a wide range of impacts to the resource by greatly altering historic patterns of drying and flooding that once occurred every few years. Natural patterns of water level fluctuations are critical for organisms that have growth and reproduction cycles associated with specific hydrologic conditions. Setting a minimum level is viewed as a starting point to define water needs for protection against *significant harm*. The present report documents a great variety of water resource issues associated with Lake Istokpoga, while technical criteria development focuses specifically on the establishment of minimum levels.

Pursuant to the requirements contained within Chapter 373 of the Florida Water Resources Act, water resource functions are identified and their technical relationships to water flow and level are described on the basis of the best available information, including the following: results of a literature review; analysis and synthesis of present and historical water level data for the lake; and data, results and conclusions from previous and ongoing investigations.

Proposed minimum water level criteria for Lake Istokpoga are linked to the concept of protecting valued ecologic components from *significant harm*. A *significant-harm* condition for Lake Istokpoga is based primarily on the concept of any negative

impact to the lake's biological resources that lasts more than two years. The specific valued ecosystem components that have been identified are fishery resources and the remaining wetland communities that fringe the lake shore (submerged and emergent aquatic vegetation, marshes and swamps). After examining available technical information, related field studies and the monitoring data collected before and after the 2001 drawdown for environmental enhancement, the SFWMD staff proposes the following MFL criteria for Lake Istokpoga:

A MFL violation occurs within Lake Istokpoga when surface water levels fall below 36.5 feet NGVD for 20 or more weeks within one calendar year, more often than once every four years.

The MFL criteria are intended to address low water levels that occur from regional drought conditions and/or from withdrawals of water from the lake or adjacent aquifers. Currently the lake receives an adequate supply of fresh water, and water levels are controlled by a fixed regulation schedule. Since the implementation in 1988 of a more comprehensive management program for lake levels, water levels have remained above 37.0 feet NGVD (National Geodetic Vertical Datum: a sea level standard measure based upon vertical datum from 1929), except during a managed drawdown as part of an environmental enhancement project. It is unlikely that a violation of the MFL criteria will occur under the current operational schedule except during controlled drawdown and enhancement projects. Establishment of MFL criteria for Lake Istokpoga may be useful as a guide for managing the frequency and magnitude of such planned drawdown events. But it is recognized that under certain circumstances, it may be necessary to conduct a controlled drawdown of lake levels of a duration or return frequency that may exceed those outlined in the proposed criteria.

An adaptive management strategy for Lake Istokpoga recognizes that the proposed MFL criteria are based on best available information, with the understanding that more information is needed in order to refine assumptions used in criteria development. Ongoing and proposed research and monitoring efforts in the Lake Istokpoga watershed will continue to provide more information that will improve our understanding of Lake Istokpoga's resources. This information will provide SFWMD staff with an opportunity to reevaluate the proposed criteria and to refine the MFL criteria in accordance with the development and implementation of the Kissimmee Basin Water Supply Plan.

The MFL criteria developed in the present document should be used as the basis for SFWMD rule development and for the issuance of consumptive use permits, both individually and cumulatively, within the Kissimmee Basin Planning Area. It is recommended that the current research and monitoring efforts by the SFWMD and the Florida Fish and Wildlife Conservation Commission, both individually and jointly, should continue, since these efforts will provide useful data for refinement of the MFL criteria and of other lake management criteria. The monitoring programs associated with drawdown and ecologic enhancement projects should consider an enhanced focus on wetland monitoring consistent with the needs of gauging *significant harm* to these resources.

